

WHAT IS CLAIMED IS:

1. An analog to digital converter, comprising:

a plurality of comparators, each comparator for  
5 comparing an input electrical signal with a respective, pre-  
selected reference electrical signal;

an encoder coupled to the comparators to receive a  
detection signal from each comparator indicative of the input  
signal; and

10 a plurality of reference circuits, each reference  
circuit coupled to a respective one of the plurality of  
comparators to supply the respective reference electrical  
signal to the respective comparator.

15 2. The analog to digital converter of claim 1, wherein each  
comparator comprises:

a comparator for comparing a voltage of the input  
electrical signal with a voltage of the respective reference  
electrical signal, the electrical signal having a pre-  
20 selected voltage.

3. The analog to digital converter of claim 2, wherein the  
encoder comprises:

an encoder to receive a detection signal from each comparator indicative of an input signal voltage.

4. The analog to digital converter of claim 3, wherein each  
5 reference circuit comprises:

an output transistor to provide the reference electrical signal;

a current source coupled between an emitter of the output transistor and ground;

10 a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor;

a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow  
15 through the reference resistor; and

a current mirror coupled in parallel with the reference resistor and control transistor to control the current flowing through the reference resistor.

20 5. The analog to digital converter of claim 4, wherein the current mirror comprises:

a resistor coupled in series with a transistor.

6. The analog to digital converter of claim 3, wherein each reference circuit comprises:

an emitter follower circuit.

5 7. The analog to digital converter of claim 4, wherein the current mirror comprises:

a trans-admittance amplifier coupled in series with a transistor.

10 8. The analog to digital converter of claim 3, wherein each reference circuit comprises:

an output transistor to provide the reference electrical signal;

15 a current source coupled between an emitter of the output transistor and ground;

a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor;

20 a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow through the reference resistor; and

a trans-admittance amplifier coupled to the base of the control transistor to control the current flowing through the reference resistor.

9. A method for digitizing an analog signal, comprising:

generating a plurality of predetermined reference  
electrical signals;

5 supplying each reference electrical signal to a  
respective one of a plurality of comparators; and

supplying an input electrical signal to each one of the  
comparators to compare the input signal with the respective  
reference electrical signal and to provide a detection signal

10 indicative of the input electrical signal.

10. The method of claim 9, wherein generating the plurality  
of predetermined reference electrical signals comprises:

generating each reference electrical signal at a  
15 preselected voltage.

11. The method of claim 10, wherein supplying the input  
electrical signal to each one of the comparators comprises:

supplying the input electrical signal to each one of the  
20 comparators to provide a detection signal indicative of an  
input signal voltage.

12. The method of claim 11, wherein generating each  
predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of emitter follower circuits to generate each predetermined reference electrical signal at the respective preselected voltage.

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13. The method of claim 12, wherein generating each predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of reference circuits, each reference circuit comprising an  
10 output transistor to provide the reference electrical signal, a current source coupled between an emitter of the output transistor and ground, a reference resistor coupled to the a of the output transistor to set an operation current of the output transistor, a control transistor coupled to the  
15 reference resistor in parallel with the output transistor to allow current flow through the reference resistor, and a current mirror coupled in parallel with the reference resistor and control transistor to control the current through the reference resistor, the current mirror comprising  
20 a trans-admittance amplifier coupled in series with a transistor; and

applying a preselected control current to the trans-admittance amplifier to control the current flowing through the reference resistor to cause the output transistor to

provide the reference electrical signal at the respective preselected voltage.

14. The method of claim 12, wherein generating each  
5 predetermined reference electrical signal comprises:

applying a supply voltage to each of a plurality of reference circuits, each reference circuit comprising an output transistor to provide the reference electrical signal, a current source coupled between an emitter of the output  
10 transistor and ground, a reference resistor coupled to a base of the output transistor to set an operation current of the output transistor, a control transistor coupled to the reference resistor in parallel with the output transistor to allow current flow through the reference resistor, and a  
15 trans-admittance amplifier coupled to the base of the control transistor to control the current through the reference resistor; and

applying a preselected control current to the trans-admittance amplifier to control the current flowing through  
20 the reference resistor to cause the output transistor to provide the reference electrical signal at the respective preselected voltage.